



# ATCF 5.0 and Related Applications

## Presenter

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**Ed Fukada, Angelo Alvarez and Staff (NMFC/JTWC)**

# Overview

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## Infrastructure

- ATCF 5.0
- Flat File Database
- Web-ATCF

## Objective Aids

- Track Consensus
- Intensity Aids, Intensity Consensus
- GPCE, GPCC, GPCE-AX
- New Wind/Central Pressure Relationship for Bogus

## JTWC Client Products

- JTWC/WW3
- Wind Probabilities
- Experimental TC-COR Settings
- GIS Products

## Publications



# JTWC Forecast Process

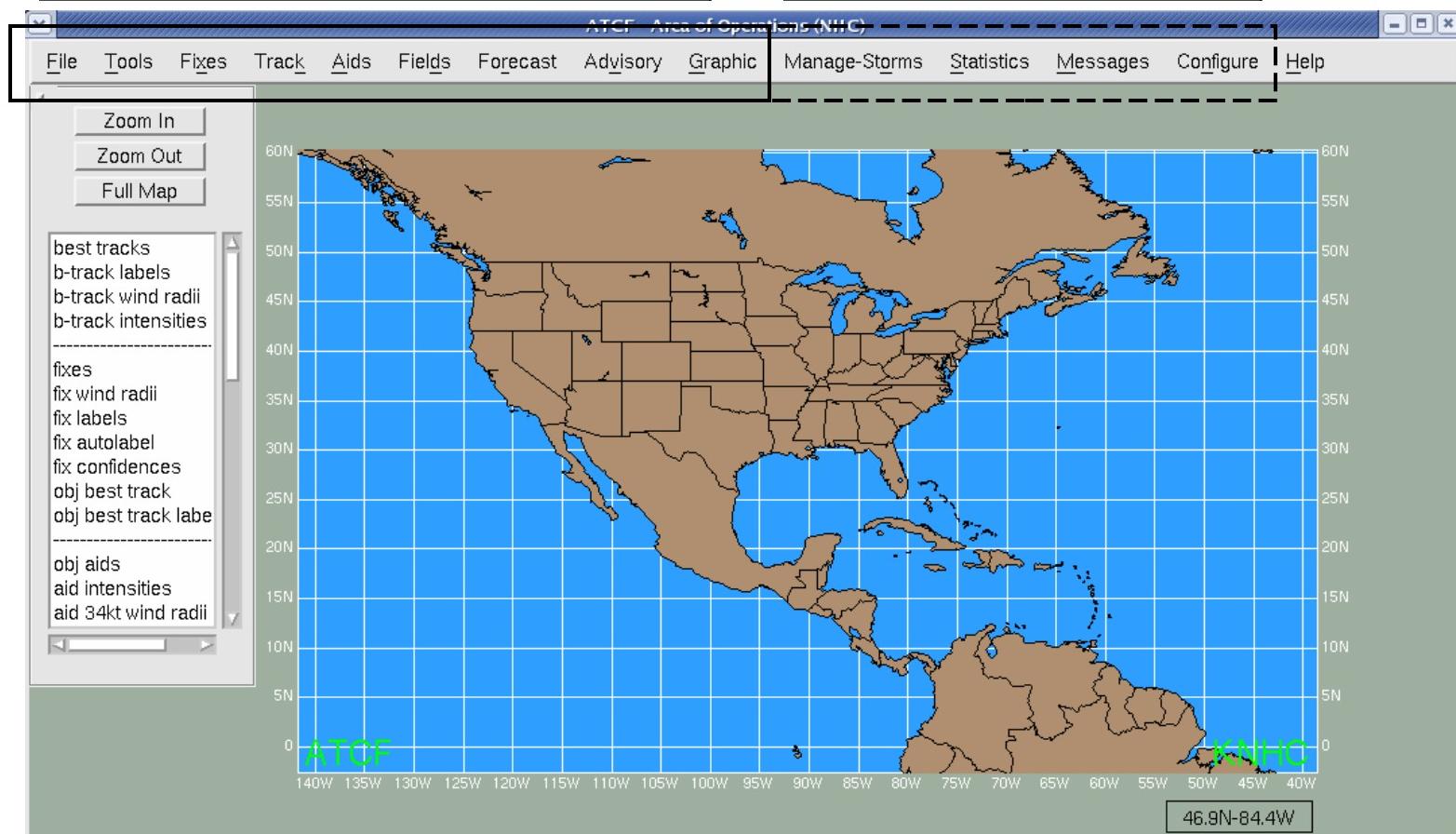


# Storm Display Window

*“main menu is eliminated”*

Storm Display Menu  
Options

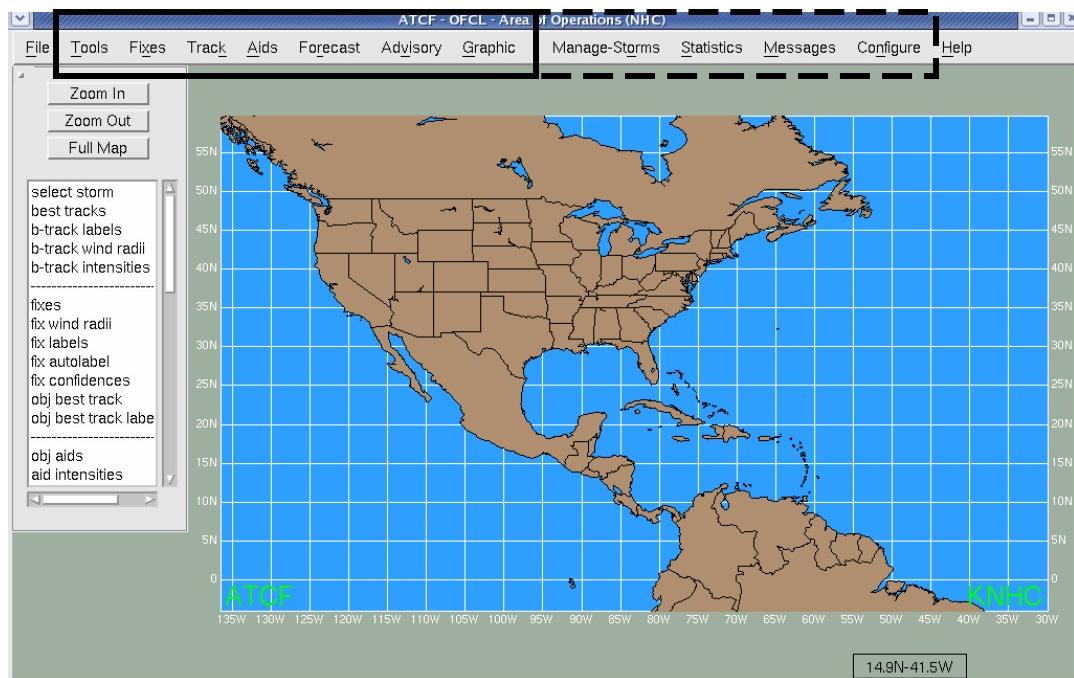
Main Menu  
Options



# Single Storm Display Window

Typical Forecast  
Process

Manage storms, do stats,  
etc.

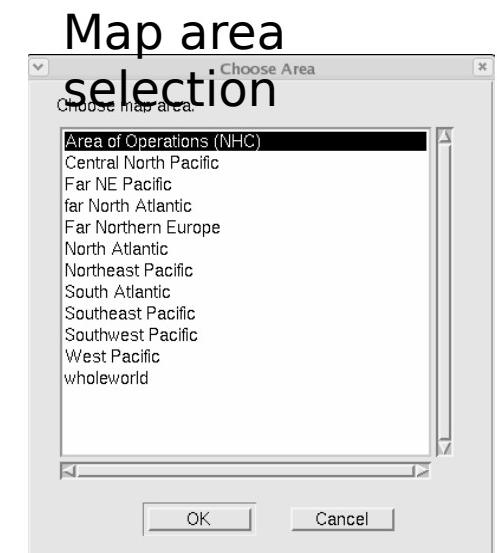
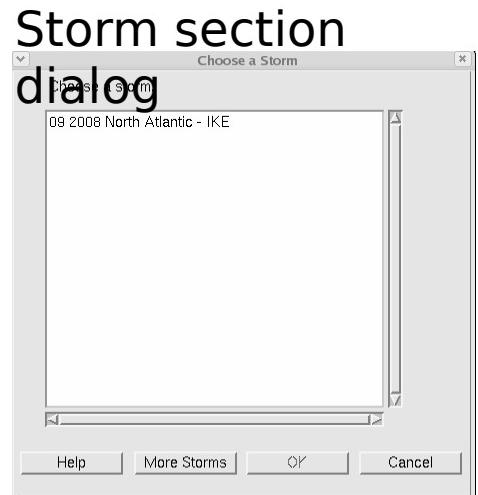
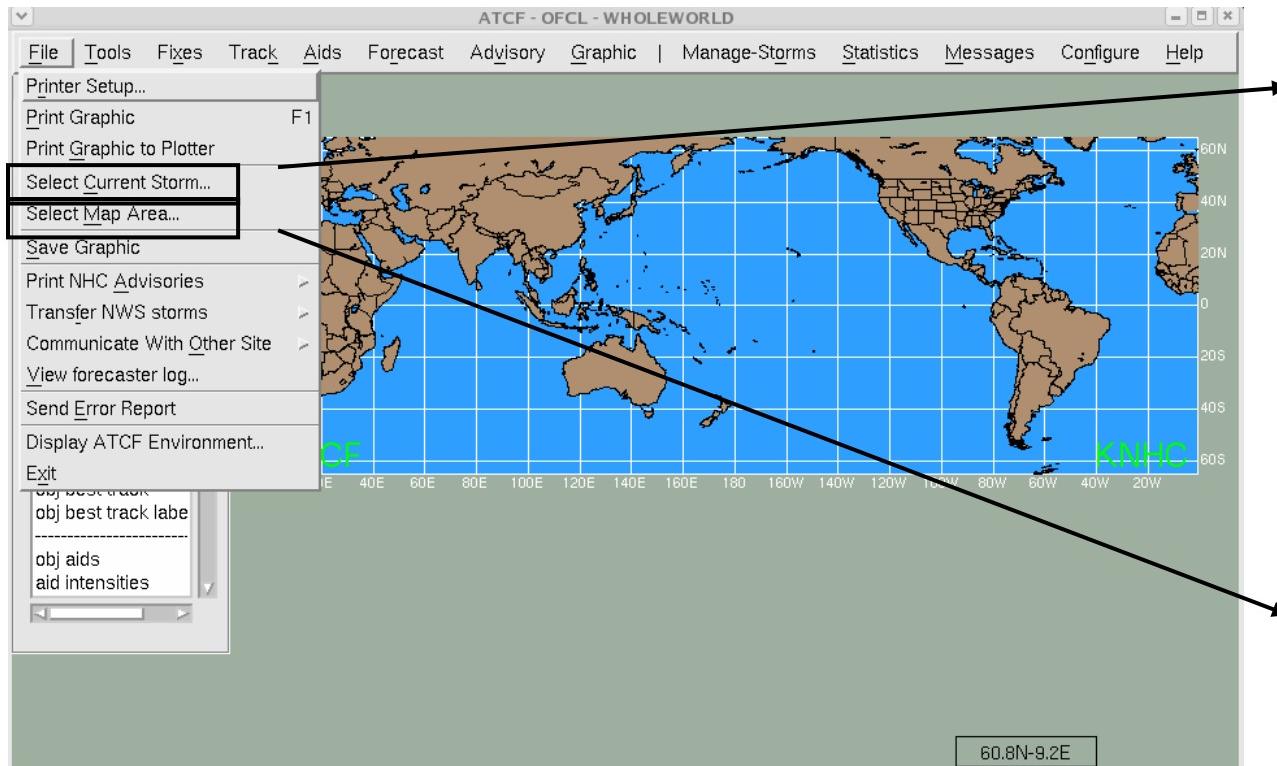


- Storm specific functions (left side)
- Previous main menu functions are now on the right (past the separator)
- User can have multiple windows open if required

"Purpose is to combine all functionality into one display for web ATCF functionality (same code base)."

# Storm or Map Area Selection

## “new changes to the display window”



“When initially started, the map area loads to a default domain”

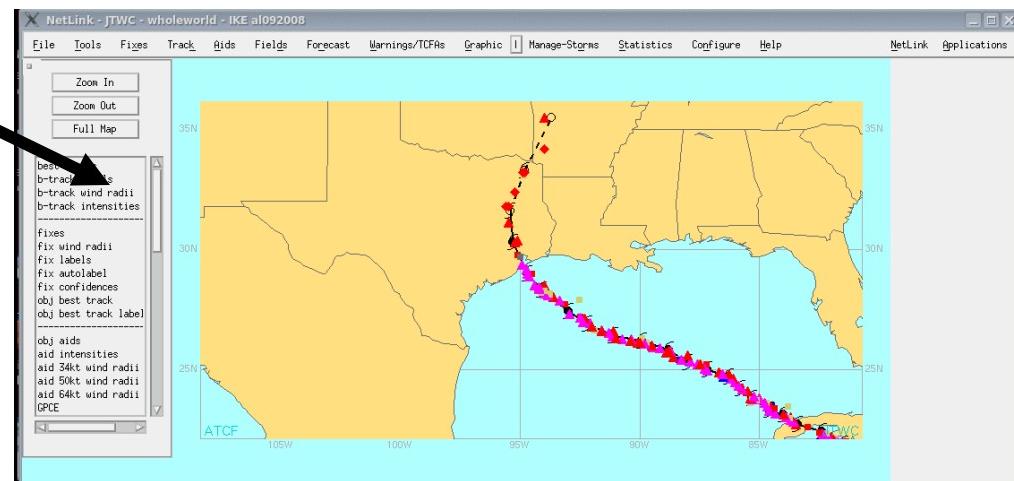
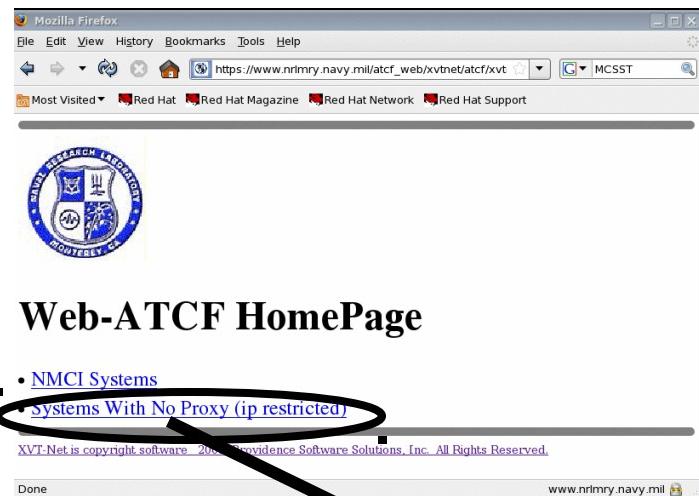
# New ATCF Flat File Database

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- 1. Replaces TEDS at JTWC**
- 2. Fed data by CAGIPS at FNMOC**
- 3. Grids**
  - **NOGAPS, GFS, UKM, COAMPS-WP, JMA Global**
- 4. Observations**
  - **A/C Wind Reports, Feature Track Winds**
  - **Scatterometer Reports, Synoptic Reports, Buoys**
  - **RAOBS, Altimeter Sig Wave Heights**

# Web-ATCF Demo

[www.nrlmry.navy.mil/atcf\\_web/xvtnet/atcf/xvtnet.html](https://www.nrlmry.navy.mil/atcf_web/xvtnet/atcf/xvtnet.html)



CAC-Enabled Demo

IP Protected Demo

Providence, SAIC, NRL

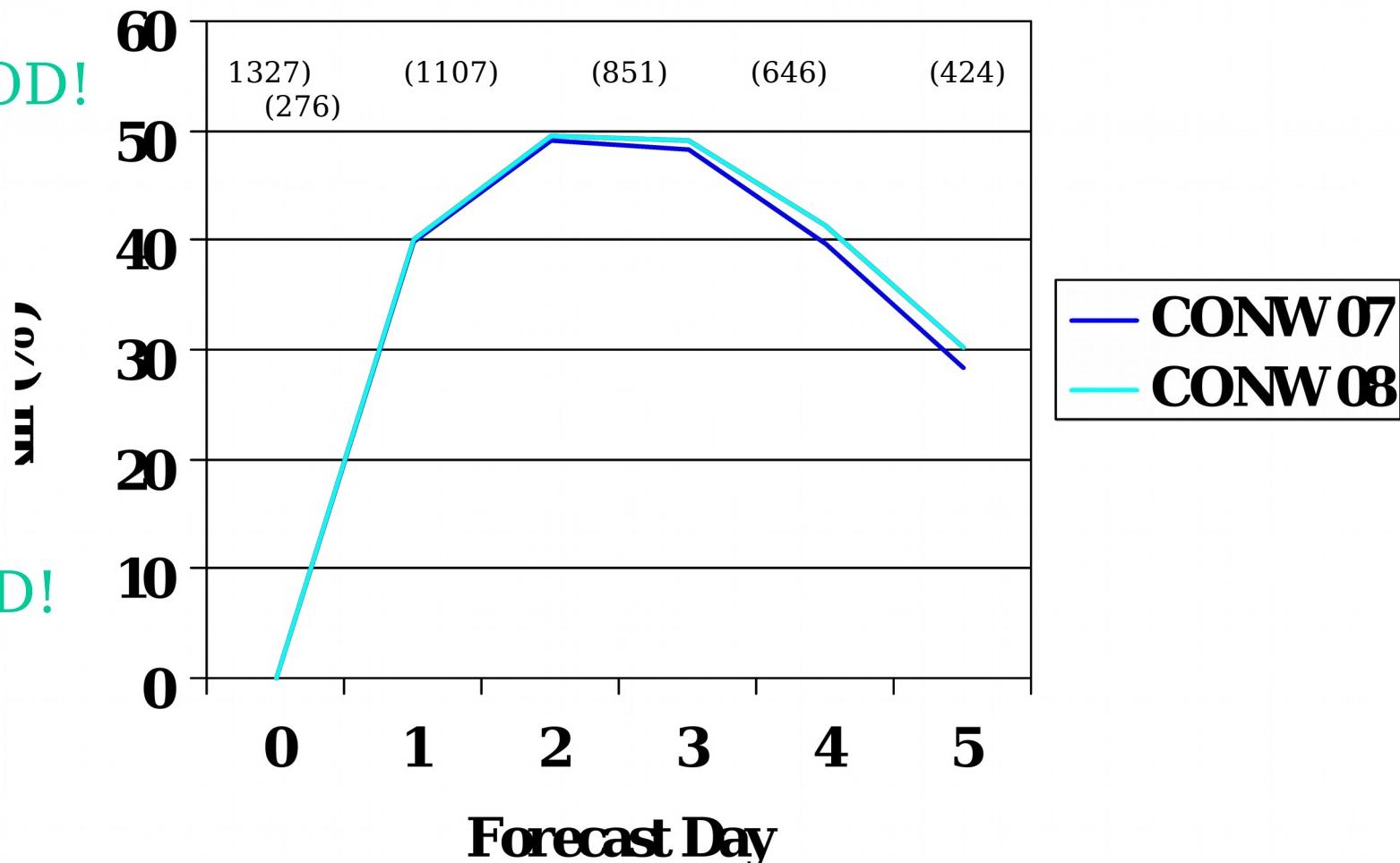
# NHC Implementation of Web-ATCF



In the NHC implementation, the forecaster uses an ATCF server (with a hot spare), and all the NWS offices on the conference call access the Web-ATCF. Used for displaying aids, fixes, forecasts ...

# WP Track Consensus Improvement

GOOD!



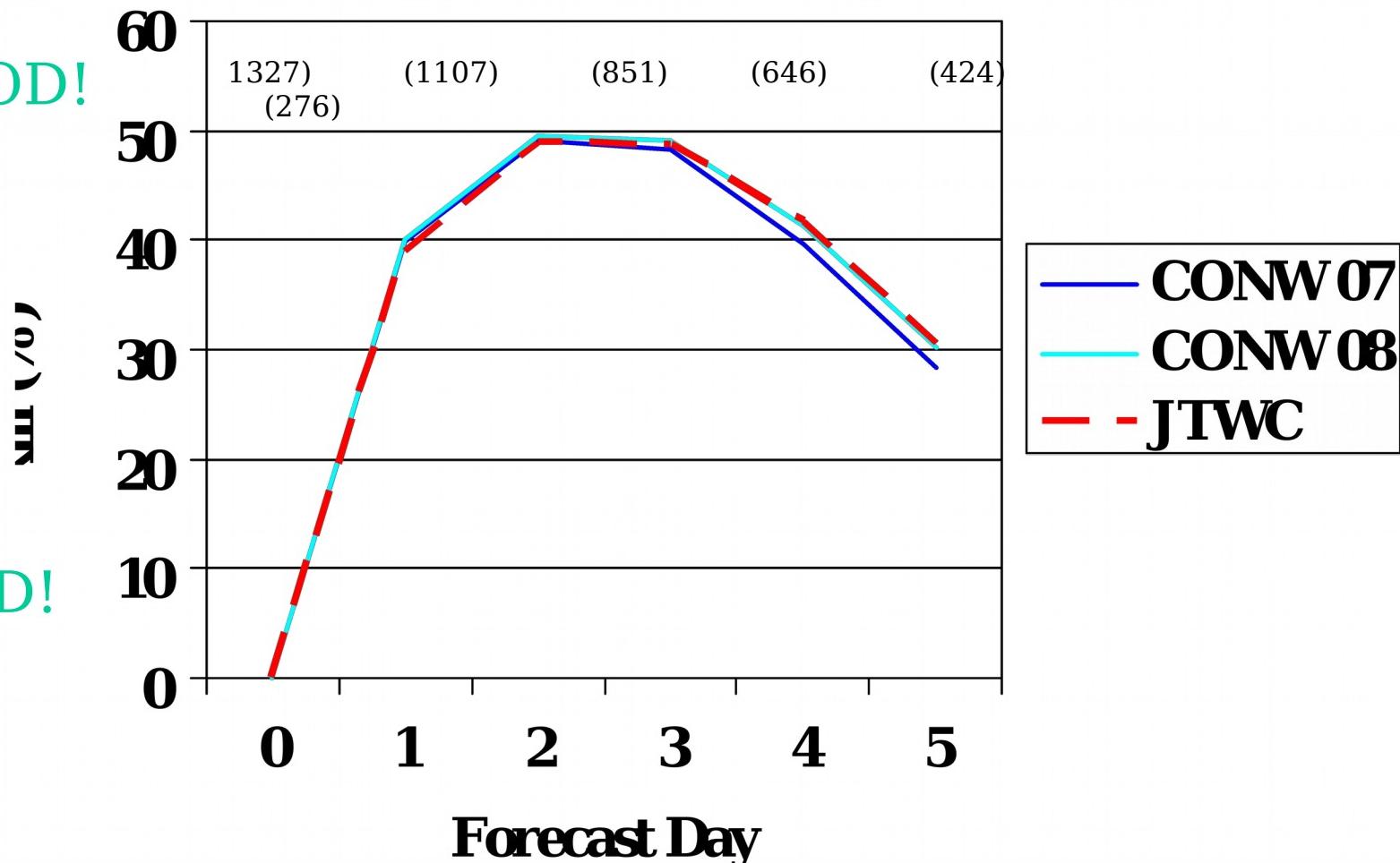
BAD!

Forecast Day

ECMWF model is now used for most consensus forecasts (CONW 08). In CONW 07 it was only used every other forecast due to latency. WP 2006-2008 (wp23) used in study. Skill is measured with

# WP Track Consensus Improvement

GOOD!



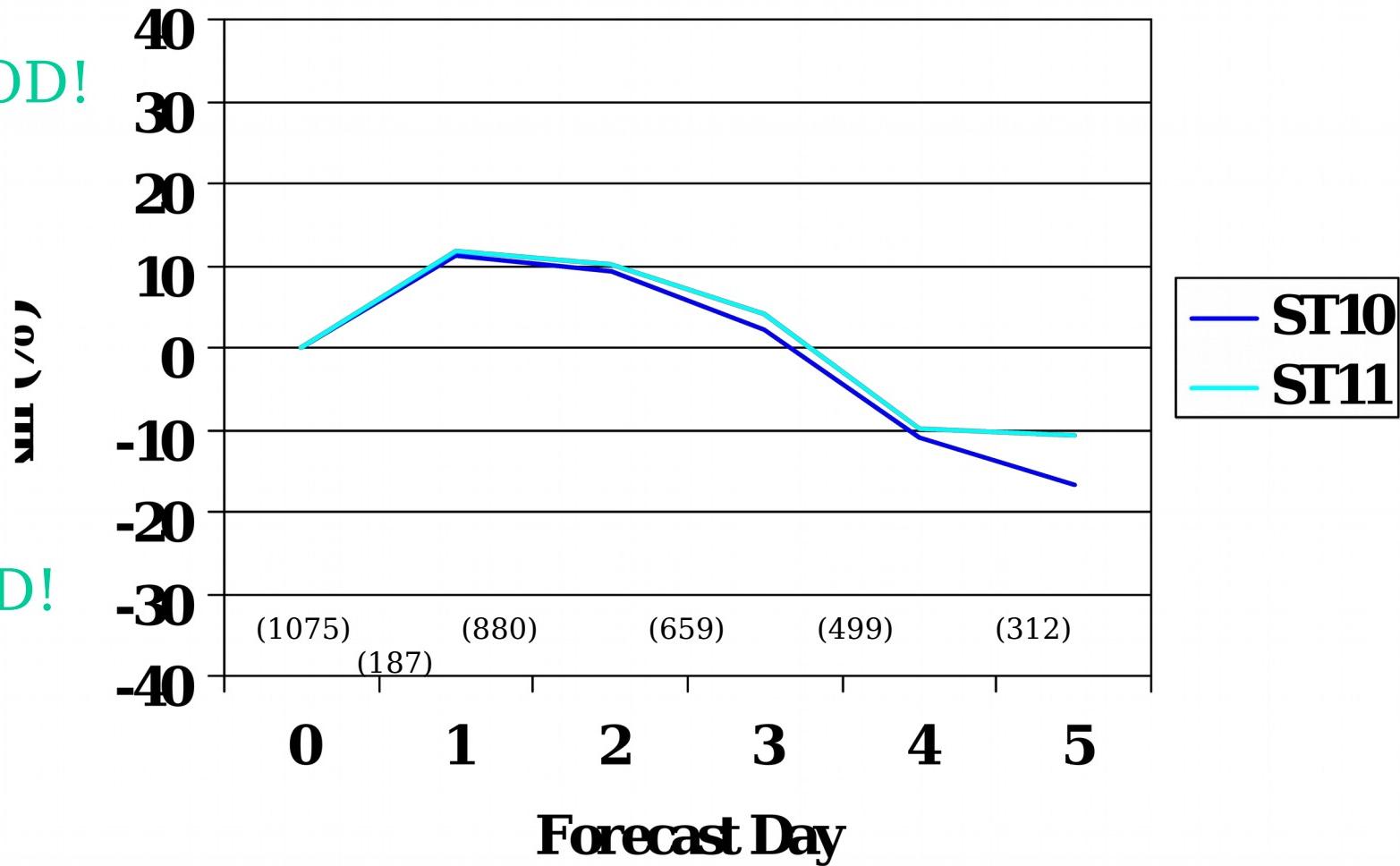
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Forecast Day

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# WP Intensity Skill Improvement

GOOD!

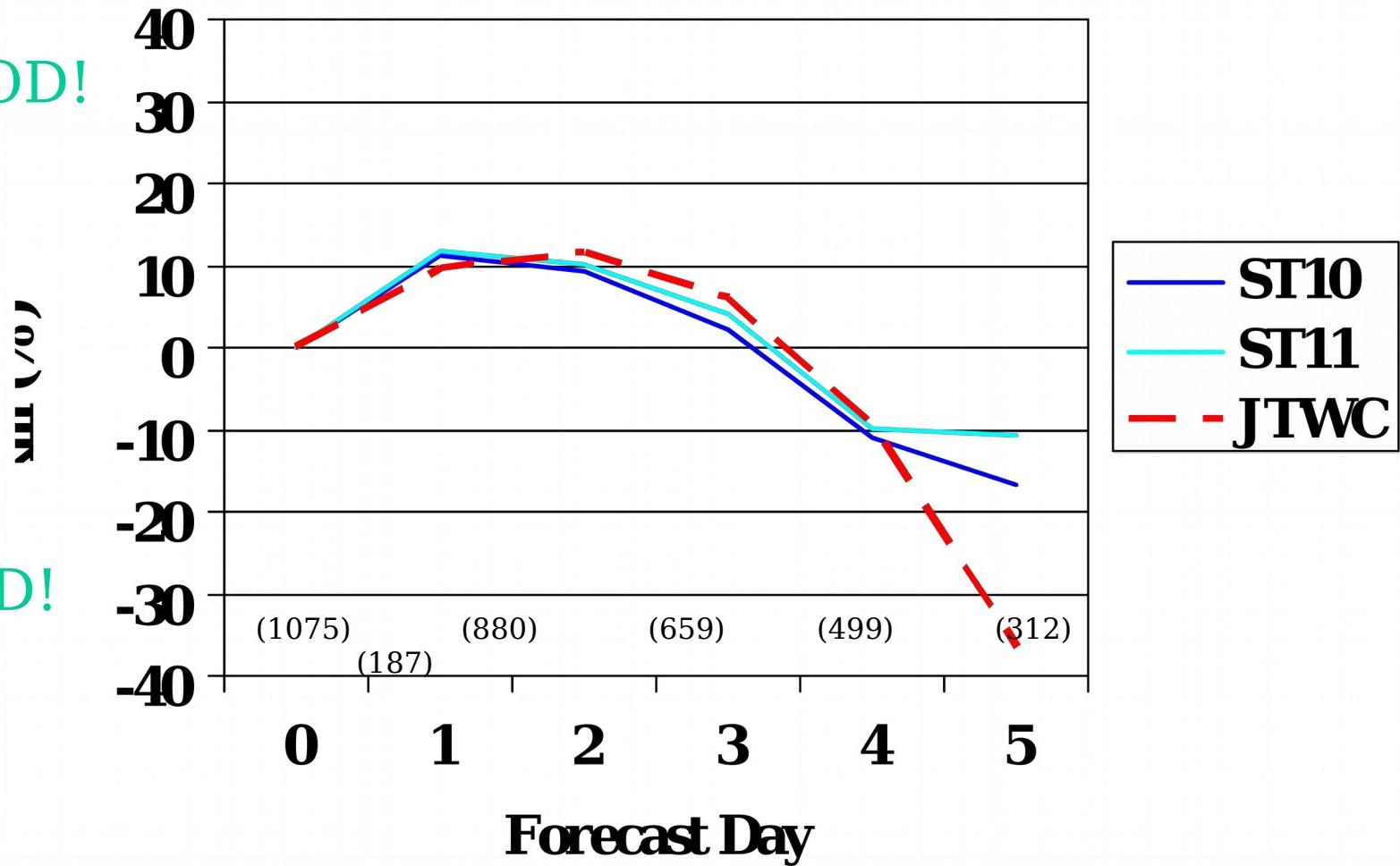


BAD!

Top-performing intensity aids have skill to three days. ST10 is a STIPS ensemble,  
ST11 = STIPS ensemble members + GFDN. GFDN has been, NCEP, NRL

# WP Intensity Skill Improvement

GOOD!

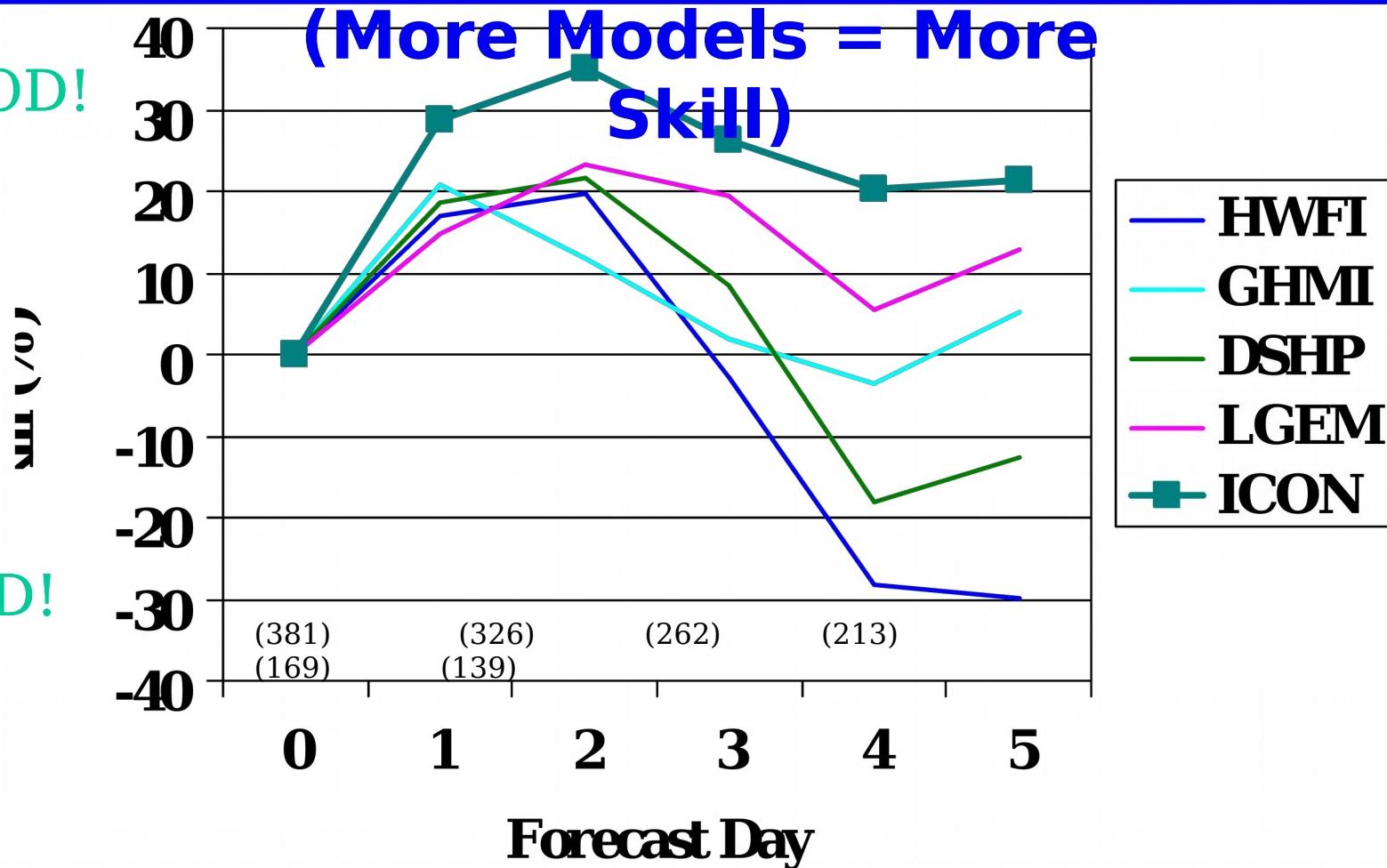


BAD!

Top-performing intensity aids have skill to three days. ST10 is a STIPS ensemble,  
ST11 = STIPS ensemble members + GFDN. GFDN has been, is, and will be used, NRL

# 2008 Atlantic Intensity Skill

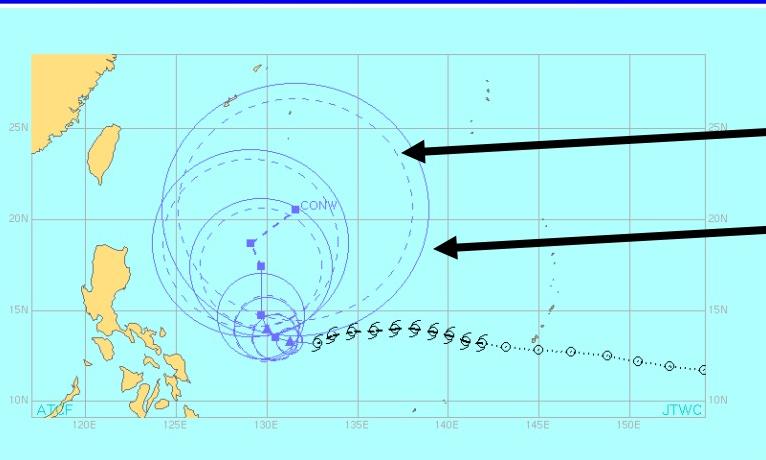
GOOD!



The four top-performing intensity models and their average (ICON). The consensus generally outperforms individual models. If more skilful models in the WP, forecast skill would improve! NCEP, NCEP, NESDIS

# Goerss Predicted Consensus Error

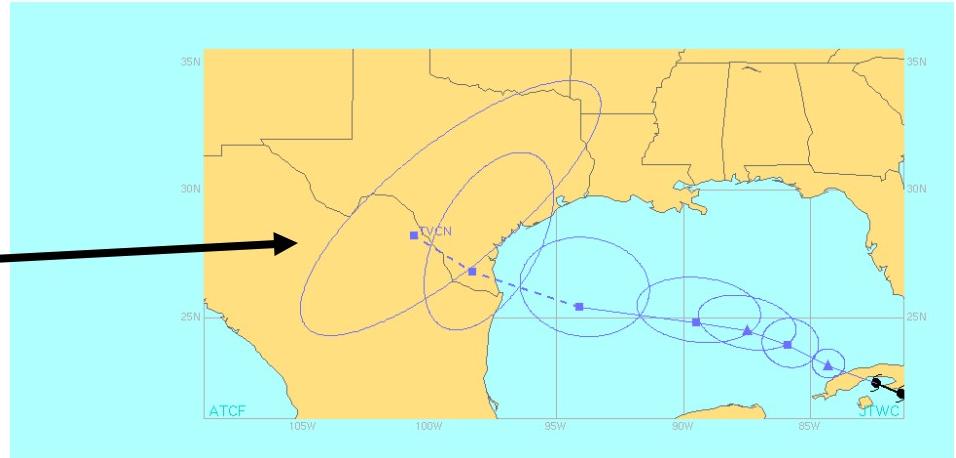
## (GPCE, GPCC, and GPCE-AX)



GPCC (WP, AL, EP)

GPCE (WP, AL, EP, SH)

GPCE-AX  
(AL only)

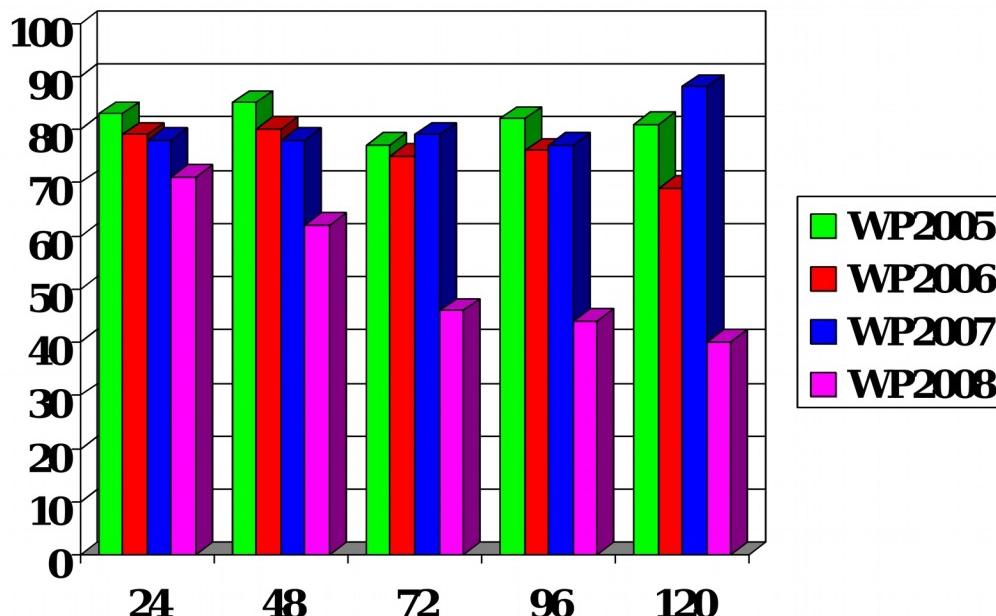


GPCE predicts the 70<sup>th</sup> percentile for each forecast period based partly on consensus spread, GPCC is a three-year average GPCE, and GPCE-AX is a set of ellipses based on cross and along track N

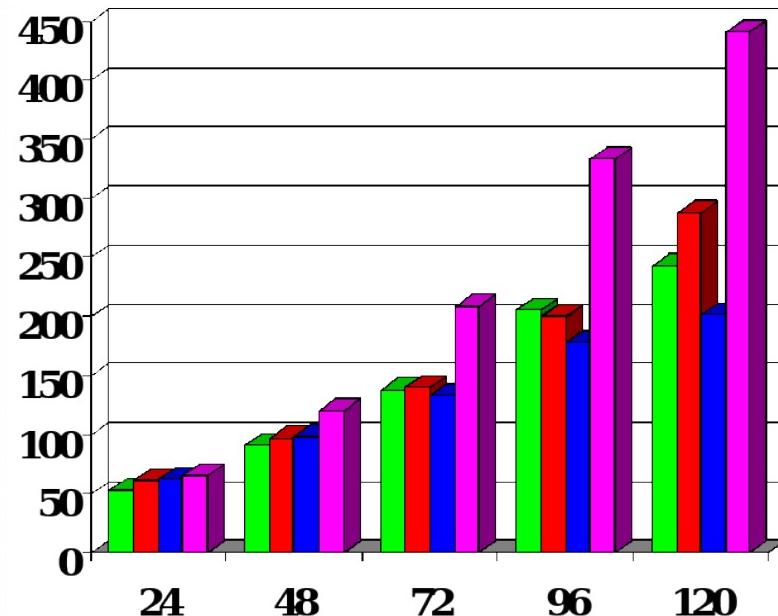


# GPCE Validation 2005-2008 Western North Pacific

**GPCE Validation  
(Percent)**



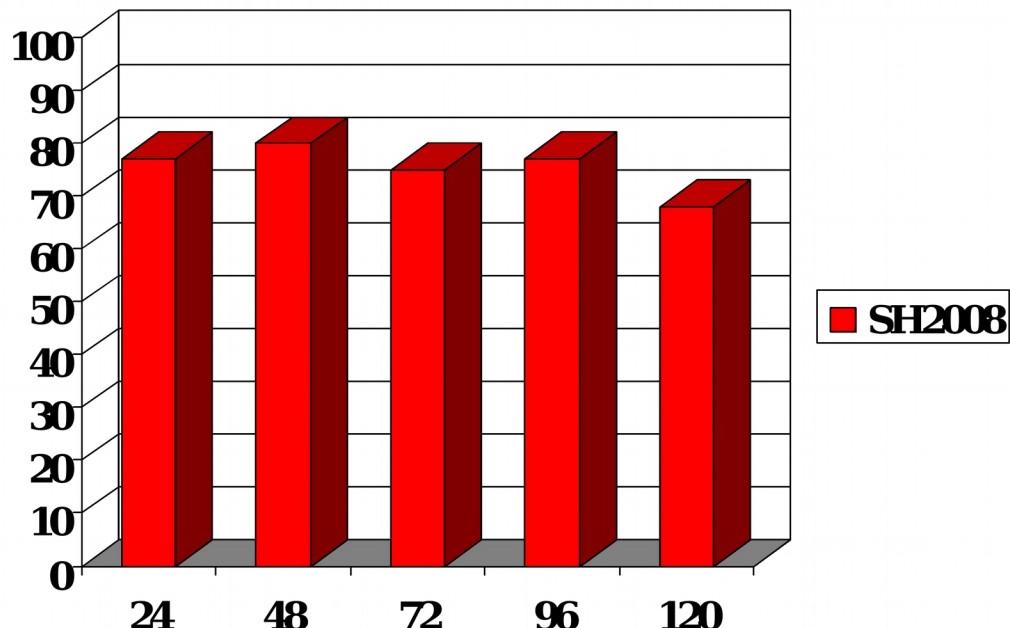
**CONW Forecast Error  
(nm)**



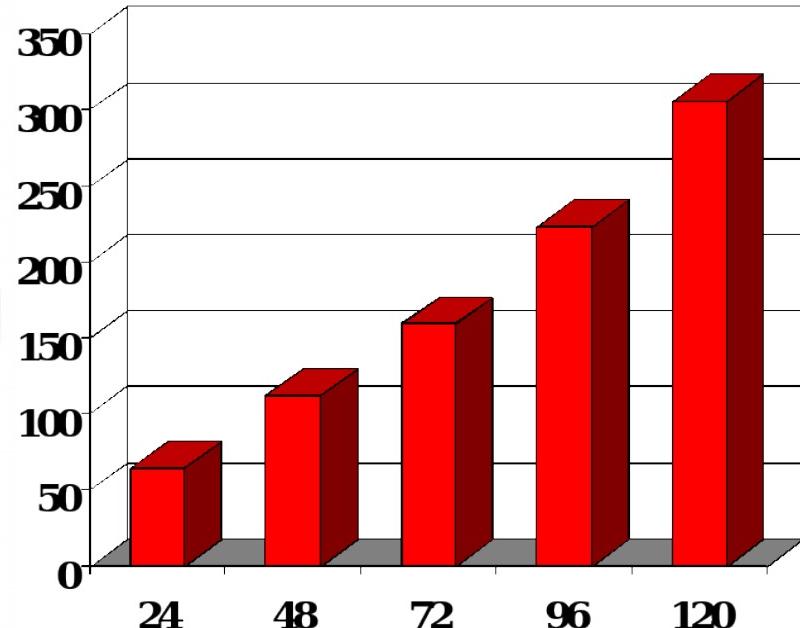


# GPCE Validation 2008 Southern Hemisphere

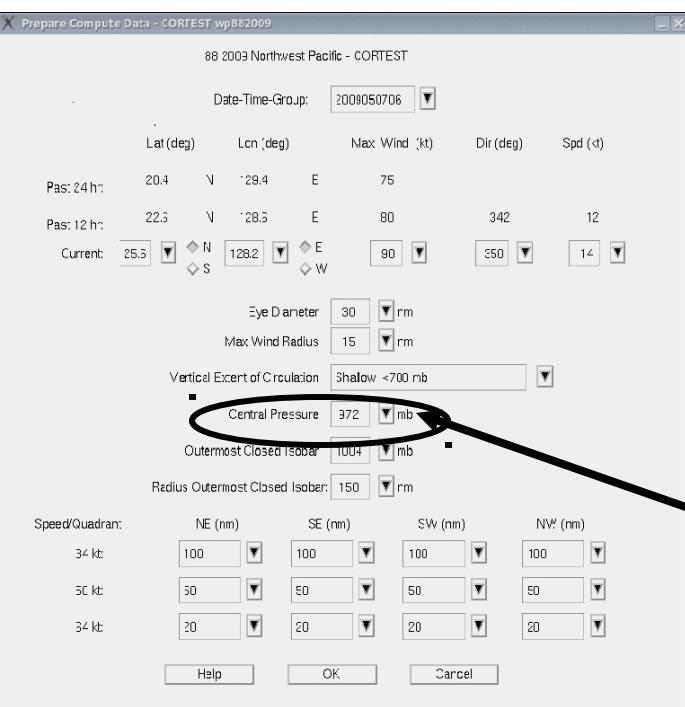
**GPCE Validation  
(Percent)**



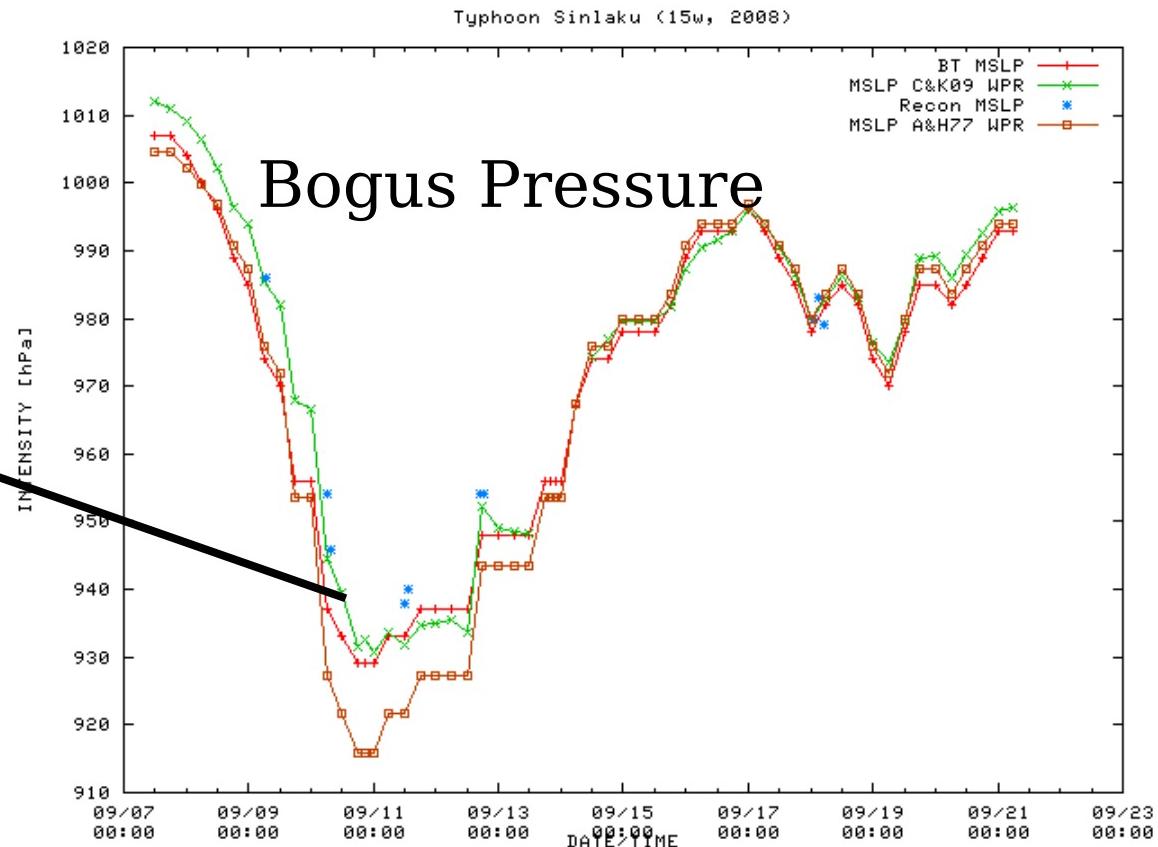
**CONW Forecast Error  
(nm)**



# New ATCF Wind/Pressure Relationship



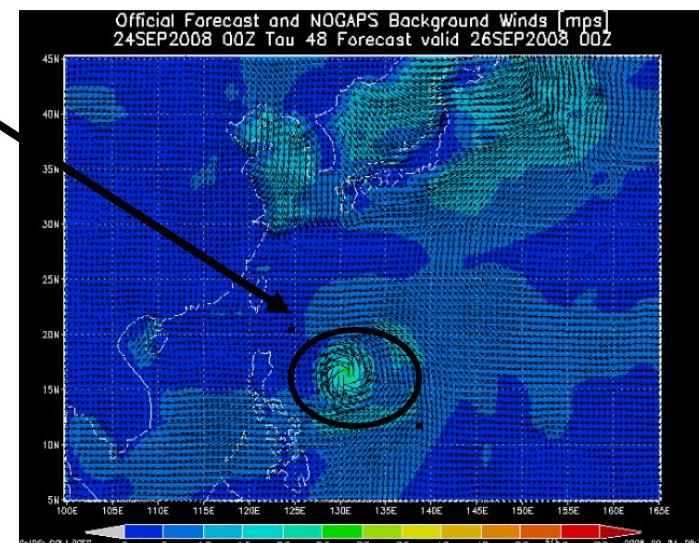
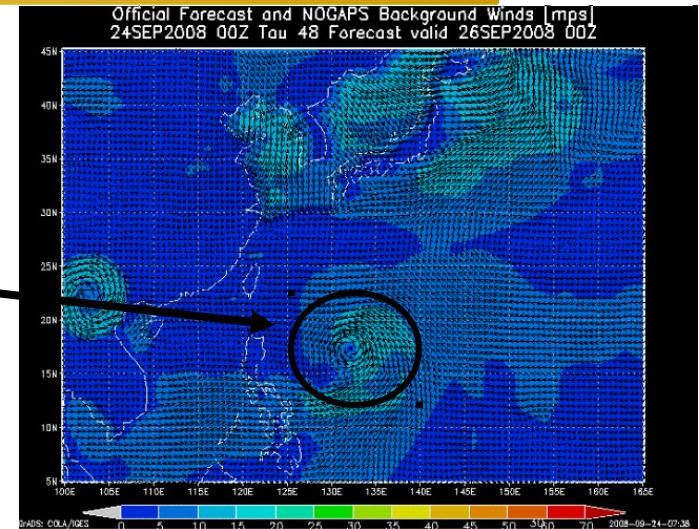
ATCF Bogus Dialog



New maximum surface wind vs pressure relationship to aid in creating a more realistic bogus for other applications (e.g., NWP models). The latest relationship (2009) depends on six sites, BoM,

# JTWC Wavewatch III (JTWC/WW3)

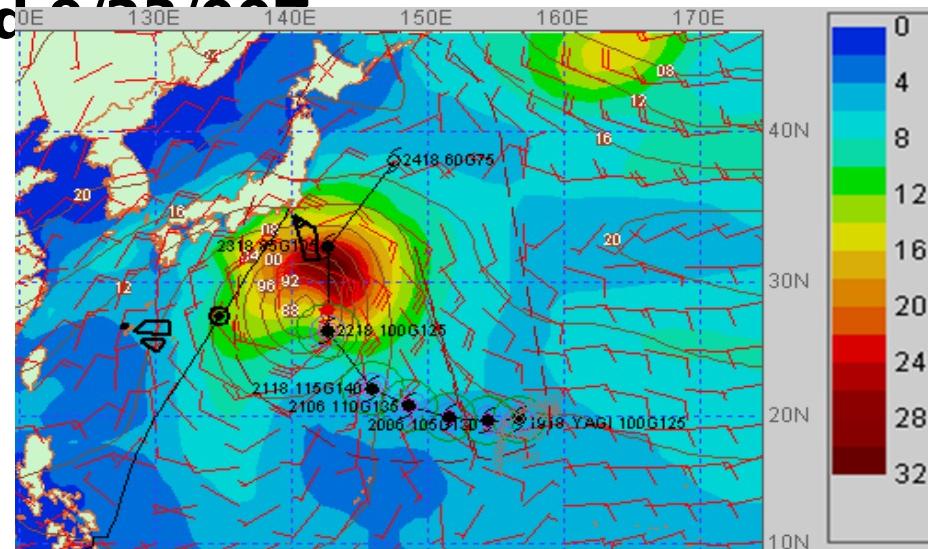
- 1. Obtain model sfc winds**
- 2. Cut out model vortex**
- 3. Generate JTWC vortex**
- 4. Insert JTWC vortex**
- 5. Run WW3**



# JTWC/WW3

## Yagi Sortie Case 9/19/18Z

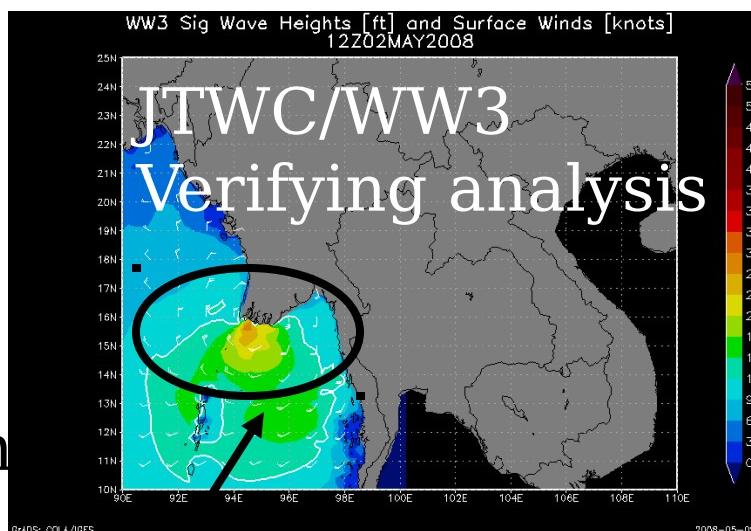
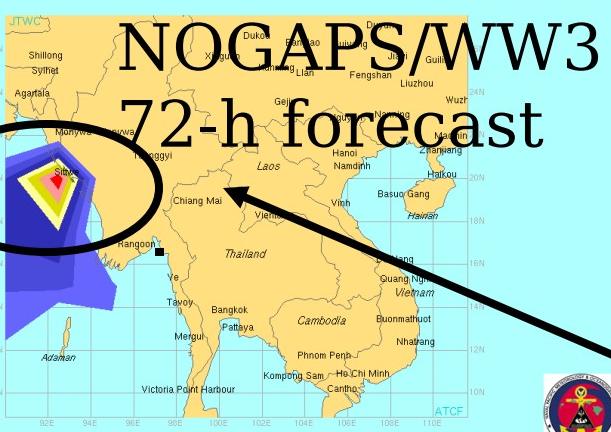
- Ships sortied from Yokosuka based on this forecast valid 9/22/18Z**



- What about JTWC/WW3? Yagi 9/19/06**

# NARGIS (IO012008)

## 2008 04 29 12Z 72-hr Forecasts



Bangladesh

Myanmar

NOGAPS/WW3 72-h forecast has high waves far north of the JTWC/WW3 forecast. Inconsistent forecasts are difficult to brief to operators. FNMOC, NRL

# JTWC/WW3 Website

**([www.nrlmry.navy.mil/atcf\\_web/wavewatch](http://www.nrlmry.navy.mil/atcf_web/wavewatch))**

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## 1. 2009 Season

- **Near real-time runs at NRL (00 and 12 UTC)**
- **Done at +12 h**
- **Gifs, Animated Gifs**
- **Shape files of 12 ft seas (courtesy FNMOC)**  
`ftp://ftp.nrlmry.navy.mil/pub/receive/sampson/WW3/SHAP  
E/`

## 2. 2010 Season Plans

- **Transition to FNMOC**
- **Multi-storm capability**

## EXPERIMENTAL TC-COR SETTINGS

SITE	TC-COR
Atsugi	4
Camp Fuji	3
Camp Zama	4
Iwakuni	3
Kadena AB	1
Narita Airport	4
Pusan	3
Sasebo	2
Tokyo	4
Yokosuka	4
Yokota AB	4
Yokohama	4

\*\*\* BASED ON JTWC WARNING NR 020 FOR TYPHOON 88W

### NOTES:

TC-COR SETTINGS ARE BASED ON RELATIONSHIP BETWEEN  
PROBABILITIES IN THE ATLANTIC AND GULF OF MEXICO.

THEY ARE OBJECTIVE GUIDANCE FOR ONSET OF 50 KT WINDS AT NAVY INSTALLATIONS.

EACH SITE HAS ITS OWN SENSITIVITIES, WHICH THESE TC-COR SETTINGS DO NOT ADDRESS.

THE FOLLOWING CUMULATIVE PROBABILITIES ARE USED FOR THE TC-CORR THRESHOLDS:

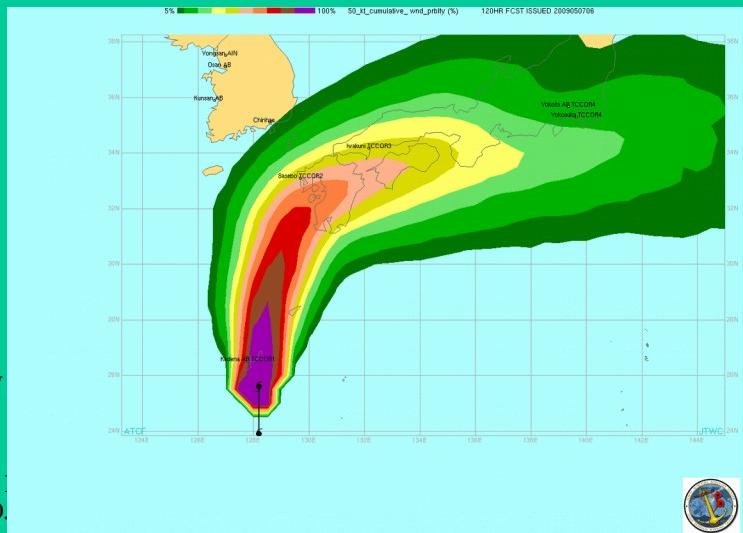
TC-COR4 5% PROBABILITY OF 50 KT AT 72 H

TC-COR3 6% PROBABILITY OF 50 KT AT 48 H

TC-COR2 8% PROBABILITY OF 50 KT AT 24 H

TC-COR1 12% PROBABILITY OF 50 KT AT 12 H

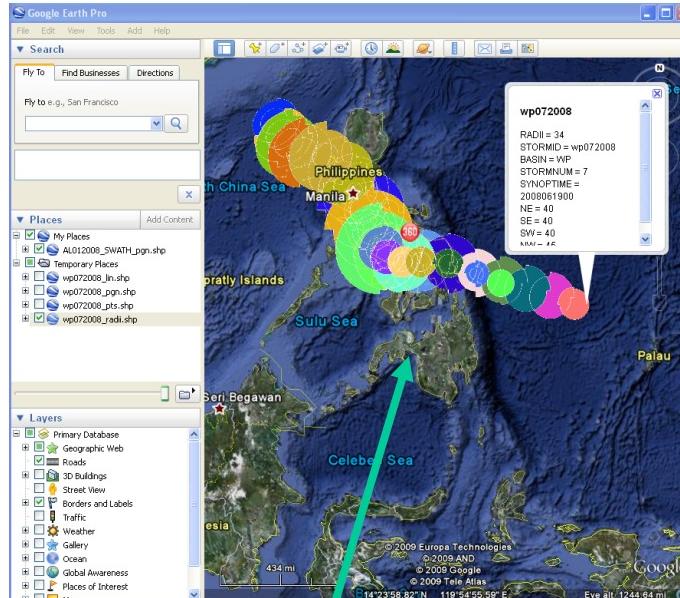
END OF EXPERIMENTAL TC-COR SETTINGS





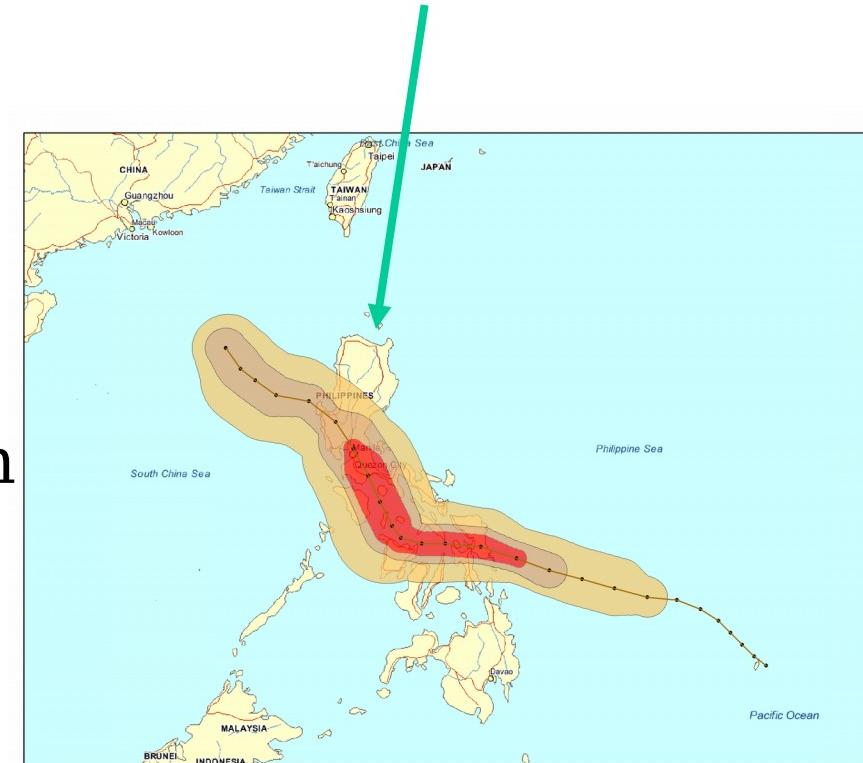
# Shapefiles for GIS Systems

## (Experimental for 2009)



Wind Radii on Google Earth

Wind Swath on ArcGIS



NHC, NRL

# Publications

DeMaria, 2007: **Sampson, C. R., J. L. Franklin, J. L., J. A. Knaff and M. intensity consensus. Wea. And Forecasting, 23, 304-312.**

Bringas, F., Sandery, P., Ramos-Buarque, and Halliwell, G. 2008. derived ocean measurments to tropical forecasting, Final GODAE Symposium 2008, Nice, [Available on-line from <http://www.godae.org>].

Goni, G., DeMaria, M., Knaff, J., Sampson, C., Ginis, I., Mavume, A., Lauer, C., Lin, I., Ali, M., S.,Kang, K., Mehra, A., Chassignet, E. Applications of satellite-cyclone intensity France.

tropical  
Warning

**Sampson, C. R., and J. A. Knaff, 2009. Southern Hemisphere cyclone intensity forecast methods used at the Joint Typhoon Center, Part III: Forecasts based on a multi-model consensus approach. Aust. Met. Mag., in press.**

tropical  
Warning  
approach.

**Knaff, J. A., and C. R. Sampson, 2009. Southern Hemisphere cyclone intensity forecast methods used at the Joint Typhoon Center, Part II: Forecasts based on a statistical-dynamical Aust. Met. Mag., in press.**

tropical  
Warning  
persistence.

**Knaff, J. A., and C. R. Sampson, 2009. Southern Hemisphere cyclone intensity forecast methods used at the Joint Typhoon Center, Part I: Control forecasts based on climatology and Aust. Met. Mag., in press.**

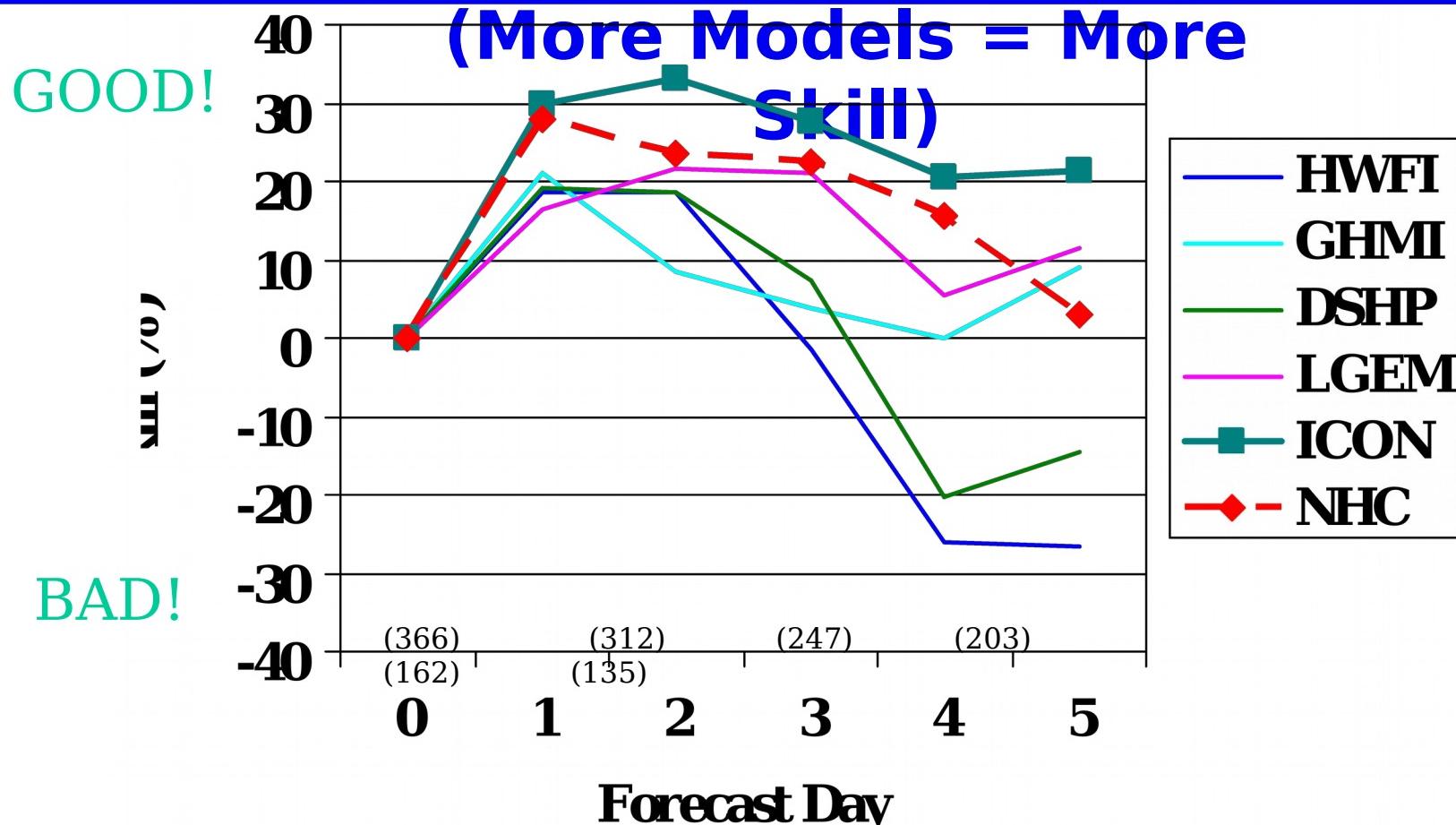
R. T. DeMaria, M., J. A. Knaff, R. Knabb, C. Lauer, C. R. Sampson, DeMaria, 2009: A new method for estimating NEDIS, NRL, NHC, AOMI tropical cyclone wind speed probabilities.



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# Questions?

# 2008 Atlantic Intensity Skill



The four top-performing intensity models and their average (ICON). The consensus generally outperforms individual models. If more skilful models in the WP, forecast skill would improve! LGEM, TC-COAMPS, ...